Practice Answer Keys (cont.)

6. $\frac{425{,}000a}{b}$ [While it looks different, this is the same problem as number 5.]
7. $\frac{9a}{b}$
8. $\frac{9}{5}$
9. These have the same value.
10. These have the same value.
11. 0
12. $\frac{14y}{3x}$
13. $\frac{xz}{2}$
14. $144xy^2z$
15. $\frac{y}{3x}$
16. $\frac{1}{3}$
17. 0
18. These are the same.
19. $\frac{12}{37} \div \frac{4}{31}$ has the larger value. $\frac{93}{37} > \frac{1}{3}$
20. 0.001

Chapter 2: Challenge Problems: Dividing Numbers and Variables (p. 14)

1. 71
2. This computation is not possible. Division by 0 is undefined.
3. There are many solutions. Four solutions are: $a = 25zy$ and $b = 6x$; $a = 50zy$ and $b = 12x$; $a = 25zyc$ and $b = 6xc$; $a = \frac{1}{6x}$ and $b = \frac{1}{25yz}$.
4. Brad might have thought he could do the problem like this. $88 \div 11 = 8$, and $48 \div 6 = 8$, and $8 - 8 = 0$. The solution, however, is 8 because $88 - 48 = 40$, $11 - 6 = 5$, and $40 \div 5 = 8$.
5. Yes, these expressions are equivalent.

Chapter 2: Practice: Order of Operations (p. 16–17)

1. 1
2. $\frac{3}{25}$
3. 3
4. 2
5. -0.5 or $-\frac{1}{2}$

Practice Answer Keys (cont.)

6. This cannot be computed because $2 - 2 = 0$, and division by zero is undefined.
7. -8
8. -5
9. 250
10. 4
11. 4
12. 9
13. $13a - 5$
14. -0.5
15. -2.5
16. 26.6
17. $\frac{8}{5}a^2 + 25$, or $1.6a^2 + 25$
18. $8z - 13$
19. 30 [Can you see the $3 \cdot 10$ in this expression?]
20. 11
21. 32
22. 0
23. 0
24. 180
25. 180. [Do you see this is the same as question 24?]
26. $\frac{1}{7}$ [If you worked these as decimals, you should have a close approximation of $\frac{1}{7}$.]
27. $46a$
28. $\frac{128}{a}$
29. $68a$
30. Cannot be performed. Denominator is zero, and division by zero is undefined.
31. 16 [Can you see this as 12 sixteens, minus one sixteen, minus 10 sixteens, leaving one sixteen?]
32. 50
33. -20
34. -2604
35. 120
36. -990
37. -1728
38. 76
39. 37
40. $9s + 37$

Practice Answer Keys (cont.)

Chapter 2: Challenge Problems: Order of Operations (p. 18)

1. $2 \bullet (5 - 3) + 8 = 12$
2. There are multiple solutions. One solution is $(20 - 5) \bullet 4 \div (-2 + 5) = 20$.
3. $-4^2 = -16$, while $(-4)^2 = 16$, so $(-4)^2$ is the larger.
4. 6
5. 24
6. Cannot be combined without knowing the value for *a*.

Chapter 2: Checking Progress: Operations of Numbers and Variables (p. 18)

1. $326w + 19v$
2. -0.893
3. $\frac{8}{15}$
4. $\frac{2}{6} = \frac{1}{3}$
5. $9.75st$
6. $0.08ab = \frac{2}{25}ab$
7. 10 times larger
8. $\frac{y}{3x}$
9. 29
10. undefined

Chapter 3: Practice: Addition and Subtraction of Integers (p. 20–21)

1. -9
2. 3,330
3. -23
4. -5
5. 5
6. 2
7. 888
8. -888
9. 0
10. 34
11. -5
12. 1
13. -1
14. 10
15. -138
16. 489,341
17. -392
18. 6,818

Practice Answer Keys (cont.)

19. 392
20. -909

Chapter 3: Challenge Problems: Addition and Subtraction of Integers (p. 21)

1. In addition to these five, there are many others: $a = -5$, $b = -12$; $a = -51$, $b = -58$; $a = -7$, $b = -14$; $a = -13$, $b = -20$; $a = -10$, $b = -17$
2. 43,526 – (-29,098,090)
3. 25
4. 55
5. 550
6. -18

Chapter 3: Practice: Multiplication and Division of Integers (p. 22–23)

1. 12
2. 23
3. -1
4. -90
5. -69
6. 217
7. -40
8. 24
9. -24
10. -240
11. If you apply the distributive property, you will see that this solution is the same as that of problem #10, -240.
12. -3
13. 13
14. 11
15. -50
16. -100
17. 11
18. 11
19. 26
20. -7

Chapter 3: Challenge Problems: Multiplication and Division of Integers (p. 23)

1. These five are among the choices: $a = -8$, $b = -18$; $a = -9$, $b = -16$; $a = -12$, $b = -12$; $a = -1$, $b = -144$; $a = -72$, $b = -2$.
2. -43,526 – (-29,098,090)
3. -250
4. 20
5. The two values are equal.

Practice Answer Keys (cont.)

Chapter 3: Checking Progress: All Integers (p. 24)

1. 5
2. -1
3. -63
4. -1,138
5. 88,731
6. (-24 • 14) = -336
7. -7
8. -7
9. -5
10. 150

Chapter 4: Practice: Identity Properties of Addition and Multiplication (p. 26)

1. $\frac{1}{432}$
2. $\frac{1}{0.23}$ or $\frac{100}{23}$
3. 0.0001 or $\frac{1}{10,000}$
4. 2,343
5. 0
6. 0
7. $\frac{213}{147}$
8. $\frac{2}{7}$
9. $-2x + (-2y) + (-z)$, or other equivalent forms, such as, $-2x - 2y + (-z)$, $-2x - 2y - z$, $-2y + (-z) - 2x$, etc.
10. $\frac{4}{0.15}$ or $\frac{400}{15}$ or $\frac{80}{3}$

Chapter 4: Challenge Problems: Identity Properties of Addition and Multiplication (p. 26)

1. $\frac{1}{483 + 951 - 17}$ or $\frac{1}{1,372}$
2. Yasmine probably thought that because 0.33 + 0.67 = 1. No, she is not right. Even though 0.33 + 0.67 = 1 is a true statement, it does not show a multiplicative inverse relationship, nor does it show an additive inverse relationship.

Practice Answer Keys (cont.)

11. $25a^2 + 67b^4$
12. $2s^4 + 2s^3$
13. $2s^3$
14. 0
15. $-34n^2$
16. $6(a^{15} + b^{15} + c^{15})$; or $6a^{15} + 6b^{15} + 6c^{15}$
17. This is the same as the previous problem.
18. This could be considered as simplified.
    Another way to write it would be $a^{13}(a^2 + 2a + 3) + b^{13}(b^2 + 2b + 3) + c^{13}(c^2 + 2c + 3)$.
19. $(2^3 + 3^3 + 4^3 + 5^3)a^7 = 224a^7$
20. $7 \bullet 7^5$. This is usually written as $7^6 = 117{,}649$
21. $373 \bullet 7^5 = 6{,}269{,}011$
22. -402,830,176
23. No. $18^3 - 18^2 = 5{,}508$
24. 34^7
25. 1, 2, 3, 4, and 5.

Chapter 5: Challenge Problems: Addition and Subtraction With Like Terms (p. 41)

1. Disagree. About the only way to rewrite it would be to use the distributive property and write it as, $z \bullet (3z + 5)$.
2. No! $1^2 + 2^2 + 3^2 = 1 + 4 + 9 = 13$; $(1 + 2 + 3)^2 = 6^2 = 36$
3. $(38w^8 - 13z^5)$
4. $b^2 - 6a - c^{15} + c$
5. 1 and 2
6. Disagree. Macy's solution would be $14^5 = 537{,}824$, which is not correct. The correct answer is -402,830,176.

Chapter 5: Practice: Multiplication and Division of Exponential Expressions (p. 43)

1. p^8
2. 3^{11}
3. 3^2
4. x^2
5. 15^2
6. $2x^2$
7. 4^{18}
8. 5^4
9. 1
10. 5^6
11. 11^4
12. 13^{42}
13. $a^{13}b^{59}$
14. a^5b^{45}

Practice Answer Keys (cont.)

15. $\frac{a^5}{b^{27}} = a^5 \div b^{27}$

16. $a^{13}b^{27}$

17. $\frac{a^5}{b^{45}} = a^5 \div b^{45}$

18. $s^{38}t^{28}$

19. $(19^7 \bullet 3^{16})$

20. $3^{18} \bullet 5^7$

Chapter 5: Challenge Problems: Multiplication and Division of Exponential Expressions (p. 44)

1. Yes, these have the same value. Another way to write either is 3^8.
2. Disagree. $13^5 \bullet 13^7 = 13^{12}$, while $(13^5)^7 = 13^{35}$.
3. Disagree. $\frac{11^{42}}{11^{21}} = 11^{(42-21)} = 11^{21}$
4. Disagree. $\frac{11^{42}}{11^{-42}} = 11^{(42-(-42))} = 11^{84}$
5. s is an integer greater than 4. That is, s is an element of the set {5, 6, 7, 8, ...}.

Chapter 5: Practice: Raising to a Power, Including Negative Exponents (p. 46)

1. 3^{12}
2. 7^0 or 1
3. 2^9
4. x^{10}
5. $\frac{1}{5^4} = \frac{1}{625} = 0.0016$
6. $\frac{1}{2^5} = \frac{1}{32} = 0.03125$
7. 7^{30}
8. These have the same value.
9. $\frac{1}{5^2} = \frac{1}{25} = 0.04$
10. 61^6
11. They are not the same. $(-13)^2 = 169$ and $13^{-2} = \frac{1}{169}$.

Practice Answer Keys (cont.)

Chapter 5: Challenge Problems: Scientific Notation (p. 49)

1. $\frac{1}{256} = 0.00390625 = 3.90625 \bullet 10^{-3}$
2. $\frac{5}{16} = 0.3125 = 3.125 \bullet 10^{-1}$
3. $\frac{0.09}{200} = 0.00045 = 4.5 \bullet 10^{-4}$
4. $\frac{(222.5)(10^5)}{(4)(10^2)} = 55.625 \bullet 10^3 = 5.5625 \bullet 10^4$
5. $\frac{(222.5)(10^2)}{(0.04)(10^5)} = 5562.5 \bullet 10^{-3} = 5.5625 \bullet 10^0$

Chapter 5: Checking Progress: Exponents and Exponential Expressions (p. 50)

1. 0.0000000032
2. -64
3. 15
4. 640
5. 216
6. $25a^2 - 67b^4$
7. $59a^2 - 67b^4$
8. $a^{55} \bullet b^{100}$
9. $\frac{1}{2^4}$; $\frac{1}{16} = 0.0625$
10. y^{100}
11. $1.278264 \bullet 10^2$
12. $t = -4$

Chapter 6: Practice: Square Roots (p. 54–56)

1. 7
2. 9
3. 10
4. 50
5. 0.6
6. $10\sqrt{3}$
7. 20
8. $0.2 = \frac{2}{10} = \frac{1}{5}$
9. $2\sqrt{10}$
10. 11
11. $11\sqrt{10}$
12. 1
13. 125
14. $25\sqrt{3}$
15. 12
16. 60
17. 30
18. 280
19. 280
20. 312
21. $4z$
22. $4z^2$
23. $4z^3$
24. $4z^6\sqrt{z}$
25. $9y^{11}$
26. x^2y
27. $8x^3y^2z^4$
28. $672x^3y^2z^4$
29. z
30. z^5
31. x^2z^4
32. $x^2z^3\sqrt{xz}$
33. xyz
34. xyz
35. xy
36. $126\sqrt{6}$
37. $3\sqrt{2}$
38. $2\sqrt{15}$
39. 30
40. $30\sqrt{6}$
41. $7\sqrt{6}$
42. $3\sqrt{2}$
43. 70
44. $5\sqrt{14}$
45. $140\sqrt{3}$
46. $3\sqrt{5}$
47. $3\sqrt{3}$
48. $2\sqrt{2}$

Practice Answer Keys (cont.)

Chapter 7: Practice: Generalizing Patterns in Algebraic Expressions and Equations (p. 68–69)

1. $x^2 - 7$; EXP
2. $3x + 6$; EXP
3. $2x + 7 = 15$; EQ
4. $2x + 10$; EXP
5. $\frac{1}{2}x - 12 = 8$; EQ
6. $18 + 12x = 50$; EQ
7. $7x + 10$; EXP
8. $15 = \frac{1}{2}(x + 8) - 40$; EQ
9. $2x - \frac{1}{3}x$; EXP
10. $2(x + 10)$; EXP
11. $x + (x + 1) + (x + 2) + (x + 3) + (x + 4) + (x + 5) + (x + 6)$; EXP
12. $\frac{1}{2}x - 8 = 40$; EQ
13. $x + 40 = \frac{1}{2}x + 60$; EQ
14. $x + 6 + 12 + 18 = 120$; EQ
15. $x - 10 + 3x = 80$; EQ

Chapter 7: Challenge Problems: Generalizing Patterns in Algebraic Expressions and Equations (p. 69)

1. $x + 50 = 10 - x$; EQ
2. $2x - \frac{1}{3}x = x - 9$; EQ
3. $2(x + 10) = 3x - 5$; EQ
4. $x + (x + 1) + (x + 2) + (x + 3) + (x + 4) + (x + 5) + (x + 6) = 5(x + 6)$; EQ

Chapter 7: Part 1: Practice: Using Algebra to Generalize Patterns Solving Simple Linear Equations (p. 71)

1. $x = -6$
2. $a = 29$
3. $x = 7$
4. $x = -18$
5. $b = 7$
6. $x = -7$
7. $a = 32$
8. $x = 11$
9. $x = -9$
10. $b = \frac{16}{7}$

Practice Answer Keys (cont.)

Chapter 7: Challenge Problems: Using Algebra to Generalize Patterns Solving Linear Equations (p. 71)

1. No value of x will work.
2. $a = 3$
3. $x = 5$
4. $x = -\frac{10}{6}$
5. $x = \frac{57}{13}$

Chapter 7: Part 2: Practice: Using Algebra to Generalize Patterns Solving Linear Equations (p. 72)

1. $x = -14$
2. $m = 17$
3. $x = -1$
4. $x = 5$
5. $b = 6$
6. $x = 9$
7. $x = 6$
8. $x = -\frac{9}{4} = -2.25$
9. $x = 2$
10. $x = -8.3$
11. $x = -1.5$
12. $x = 2$
13. $x = 5$
14. $x = 15$
15. $x = \frac{11}{12}$
16. $x = 0.01$
17. $x = 100$
18. $x = \frac{56}{3}$
19. $x = \frac{-2}{13}$
20. $x = 0$

Chapter 7: Checking Progress: Using Algebra to Generalize Patterns Numbers (p. 73–74)

1. A) 47, 53, 59;
   B) 15th term is 101
2. -96
3. The 6th term in each will be 35.